Koch, Kristine

From: James McKenna <jim.mckenna@verdantllc.com>
Sent: Wednesday, November 05, 2014 5:23 PM
To: Koch, Kristine
Cc: Jennifer Worenets (jworonets@anchorqea.com); Bob Wyatt (rjw@nwnatural.com); Carl Stivers (cstivers@anchorqea.com); Gene Revelas (grevelas@integral-corp.com); Sheldrake, Sean; Mullin, Jeanette (MullinJM@cdmsmith.com); KingTW@cdmsmith.com; Muza, Richard; Coffey, Scott (CoffeySE@cdmsmith.com); Amanda Shellenberger (ashellenberger@anchorqea.com)
Subject: FW: Portland Harbor - depositional areas/ natural recovery
Attachments: Response to EPA Response on EPA Deposition Eval 2014-11-05.pdf

Kristine,
Per my email response to Lori below, attached please find a memo that provides additional technical details regarding how deposition rates are evaluated in the 2012 Draft FS. Please forward this email to anyone on your technical team you deem appropriate that I did not include in the cc list.

Please contact me or Carl Stivers if you have any questions.

Thanks,

Jim McKenna
Verdant Solutions, LLC
5111 SE 41st Avenue
Portland, Oregon 97202
Office: (503) 477-5593
Cell: (503) 309-1621
jim.mckenna@verdantllc.com

From: James McKenna
Sent: Wednesday, November 5, 2014 3:26 PM
To: 'Cohen, Lori'
Cc: Koch, Kristine; Sheldrake, Sean; Yamamoto, Deb; Gustavson, Karl; Muza, Richard; Wyatt, Robert; Margaret Kirkpatrick (margaret.kirkpatrick@nwnatural.com); (jworonets@anchorqea.com)
Subject: RE: Portland Harbor - depositional areas/ natural recovery

Lori,
Thank you for your reply to our October 6th email. We discussed your responses with our technical team and it appears EPA may have misunderstood the context of the survey uncertainty discussion in Appendix La. Specifically, the reference to ± 0.5 ft (6 inches or 15 cm) is a general statement regarding typical bathymetry surveys. The main text of Section 6.2 (p.6-11), where the MNR evaluation is discussed, states that for the work conducted at Portland Harbor the uncertainty is only ± 3 inches (7.5 cm).

We are generating a more detailed technical memo on this matter and will be sending it to Kristine Koch soon. We look forward to continuing this discussion with the EPA RPM and technical team.

Thanks, Jim.

From: Cohen, Lori [mailto:Cohen.Lori@epa.gov]
Sent: Tuesday, October 21, 2014 1:31 PM
To: James McKenna; Wyatt, Robert; Margaret Kirkpatrick (margaret.kirkpatrick@nwnatural.com); (jworonets@anchorqea.com)
Cc: Koch, Kristine; Sheldrake, Sean; Yamamoto, Deb; Gustavson, Karl; Muza, Richard
Subject: FW: Portland Harbor - depositional areas/ natural recovery

All –
Prior to our meeting on Thursday, we thought it might be helpful to respond to some of Jim's questions with regard to depositional areas as related to natural recovery areas at the Portland Harbor site. We embedded the answers to his specific questions in his email below and hope this is helpful to you. Please forward this message to others as appropriate.

Please note we have invited Karl Gustavson to call in for our meeting Thursday since the LWG has indicated an interest in discussing the CSM.

We look forward to speaking with you Thursday.

Thank you.
Lori Cohen

From: James McKenna [mailto:jim.mckenna@verdantllc.com]
Sent: Monday, October 06, 2014 12:10 PM
To: Cohen, Lori
Cc: Wyatt, Robert; Koch, Kristine; Margaret Kirkpatrick (margaret.kirkpatrick@nwnatural.com); Yamamoto, Deb; Muza, Richard; Jennifer Worenets (jworonets@anchorqea.com)
Subject: RE: Portland Harbor - natural recovery areas

Lori:

As a follow-up to your conversation with Margaret and Bob's voicemail to Kristine last week, we want to thank you for clarifying your comments regarding deposition rates in Portland Harbor. We also appreciated your comment at the conference, which is reiterated in your email, that EPA believes there are some natural recovery areas in the river. Natural recovery is an important mechanism and requires a strong understanding how the river system works (i.e., part of the RI), and influences alternatives development and assessment (i.e., the FS). However, we disagree with your comments that natural recovery is limited to a relatively small percentage of areas.

There are a few statements in your email that I want to respond to or seek further clarification from EPA. In your second paragraph you present some deposition rates based on CDM's work. You end the paragraph stating *"I understand the LWG has all of the backup information used to prepare this chart."* The LWG has the bathymetric data utilized by CDM, and we have one map from EPA showing areas consistent with the last two columns in EPA's table. However, we do not have a description of assumptions and factors that went into CDM's deposition calculations. It would be helpful in our understanding of CDM's deposition calculation to see EPA's backup information.

> **EPA Response: As provided to the LWG in a meeting on June 5, 2014, EPA defines depositional areas as >2.5 cm/year of deposition or a subsurface to surface core ratio of >2. The draft FS uses sedimentation rate of >1 cm/yr and a core ratio of >1.5 for determination of depositional areas based on the analysis and rationale presented in Section 6.2.2.1.1. Appendix La of the Draft FS (p. 37) states that the typical survey measurement error range is 0.5 feet, resulting in an uncertainty range of 1 foot for bed elevation changes between two surveys. The uncertainty range in one direction (i.e., depositional) would be 6", which equates to roughly 1"**

(2.5 cm) per year for the period between the 5/2003 and 1/2009 surveys. Therefore, the depositional criterion EPA is using assesses deposition that can reliably be detected using the available survey data.

Also in your second paragraph you state *"The chart indicates that if you look only within the Sediment Decision Units (SDUs or areas where EPA expects to propose remedial action)…"* It has been our understanding that the areas of remedial action (active remedies) will be defined by the boundaries of the Remedial Action Levels (RALs) for each alternative, resulting in Sediment Management Areas (SMAs) for each alternative. This is consistent with both the 2012 Draft FS approach and EPA's presentations in FS technical meetings this year. SDUs are a concept developed by EPA after the 2012 Draft FS, and which EPA indicates may be used as a line of evidence to assess the effectiveness of alternatives in the revised FS. As such the LWG assumes areas of active remedy will still be defined by SMAs, not by SDUs.

EPA Response: The LWG is correct that active remedies (capping, dredging, EMNR, and in-situ treatment) will be defined by the boundaries of the remedial action levels for each alternative. MNR, which is also a remedial action, is expected to occur sufficiently at all areas outside the RAL boundaries, but within the boundary exceeding the PRGs. In the revisions to the FS, each alternative will be evaluated both within the SDU and throughout the site (note: this is not a site-wide average) to determine long-term effectiveness and permanence of the remedial alternative. This evaluation will be conducted in the detailed evaluation in the FS.

In your third paragraph you state the main difference between the LWG and EPA view of natural recovery is that the LWG includes neutral (stable) areas with depositional areas. Consistent with EPA's 2005 contaminated sediment remediation guidance, natural recovery is evaluated through multiple lines of evidence, not just evidence of deposition. Natural recovery not only includes physical isolation through the deposition of incoming sediments, but also other processes such as degradation/transformation, reducing bioavailability, and other physical processes such dispersion. The draft FS uses a multiple lines of evidence approach to determine whether neutral areas based on bathymetry data are likely or unlikely to naturally recover.

EPA Response: Section 6 of the LWG's draft FS states natural recovery is the primary mechanism for deposition, and that other lines of evidence are also based on deposition processes. EPA believes that considering other lines of evidence is important as well, and this is consistent with common knowledge that persistent organic contaminants (e.g., PCBs, dioxins/furans, DDx and some PAHs) do not appreciably degrade in the environment, which is the main reason many of these contaminants still exist in the river sediments today even though they were released many decades ago.

It appears that for depositional areas the main difference in the LWG and EPA approach appears to be how "depositional area" is defined (i.e., at what rate of sediment accumulation does one consider an area depositional?). The rate of accumulation utilized by EPA to define "deposition" (2.5 cm/year or 15 cm over the 6 year period between 2003 and 2009) is about twice the rate utilized by the LWG (7.5 cm over the 6 year period). The LWG's rate is based on the known precision of the bathymetry survey equipment and data evaluation consistent with standard accepted methods (see 2012 Draft FS p. 6-11). It would be helpful to see EPA's backup for the 2.5 cm/year accumulation rate so that we can understand the rationale for its proposed use in the revised FS. There may also be other differences between EPA's and LWG's analyses of the bathymetry data, but we are not able to identify them without the backup information on EPA's analysis.

EPA Response: As provided to the LWG in a meeting on June 5, 2014, Appendix La of the LWG's Draft FS (p. 37) states that the typical survey measurement error range is 0.5 feet, resulting in an uncertainty range of 1 foot for bed elevation changes between two surveys. The uncertainty range in one direction (i.e. depositional) would be 6", which equates to roughly 1" (2.5 cm) per year for period between the 5/2003 and 1/2009 Surveys. Therefore, the depositional criterion assesses deposition that can reliably be detected using the available survey data.

Also in your third paragraph you state EPA established the depositional areas on bathymetry and not a model. The LWG also established depositional areas based on evaluation of the various bathymetric surveys. Although the draft FS sometimes discusses model information as well, the LWG's determination that 63% of the Site is depositional (see the first column in draft FS Table 2.1-1) is based strictly on the bathymetric surveys, not a model. This is also true for the LWG's assessment of neutral (stable) areas and areas exhibiting erosion.

The LWG is prepared to discuss the technical details of these matters with the EPA project team as part of the remaining RI and FS discussions. In the meantime, please contact me if you have any questions.

Thanks,

Jim McKenna
Verdant Solutions, LLC
5111 SE 41st Avenue
Portland, Oregon 97202
Office: (503) 477-5593
Cell: (503) 309-1621
jim.mckenna@verdantllc.com

From: Cohen, Lori [mailto:Cohen.Lori@epa.gov]
Sent: Friday, September 19, 2014 11:40 AM
To: Margaret Kirkpatrick (margaret.kirkpatrick@nwnatural.com)
Cc: James McKenna; Wyatt, Robert; Koch, Kristine; Yamamoto, Deb; Muza, Richard
Subject: Portland Harbor - natural recovery areas

Hi Margaret,

This is a note to follow up on the information I provided at last Friday's Environmental Law and Education Center conference relative to natural recovery at the Portland Harbor site. The information I provided was based on an initial discussion of deposition based on bathymetry in the Study Area and was an underestimate. I apologize for any confusion on this.

EPA believes there are some natural recovery areas in the river. CDM Smith conducted the analysis in the attachment based on 10'x10' pixels of bathymetric change, and shows that there are 39-47% depositional areas in the study area. The chart indicates that if you look only within the Sediment Decision Units (SDUs or areas where EPA expects to propose remedial action), the percentage drops to 32-40%. I understand the LWG has all of the backup information used to prepare this chart.

As EPA has shared with the LWG, the main difference between how EPA views natural recovery areas compared to the LWGs view as presented in its draft FS, is that the LWG includes areas of neutral deposition (transitional areas) as deposition and EPA does not. EPA includes areas considered to be depositional based on existing bathymetric data (not a model).

The project team will be reviewing and discussing this in more detail as part of the FS.

Lori